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International monetary fund conditionality and structural reforms: Evidence from developing countries

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Abstract

The global economy, dominated by the consequences of a disastrous health crisis and international tensions, needs policy support to regain its growth dynamic. To regain an inclusive and sustainable growth dynamic, structural policies of governments are needed to allow a reallocation of resources and to stimulate productivity. International cooperation seems to be necessary and the IMF's contribution could play an important role in promoting reforms. Indeed, in IMF-supported programmes, the conditions for developing countries' transition to liberalization and open markets are often common. We address the question of whether periods of International Monetary Fund (IMF) conditionality contribute to the promotion of structural reforms in developing countries. Through the entropy balancing method and alternative identification strategies, we show that IMF conditionality programmes promote structural reforms in developing countries. We show that the effect of IMF conditionality can vary depending on the type of conditionality, the type of reform, the time frame and the initial level of structural reforms and can depend on some structural factors including

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the business cycle, the quality of fiscal and monetary policy, the level of development and the quality of institutions. Furthermore, we show that IMF conditionality can have spillover effects on trading partners and that IMF conditionality programmes that are met tend to have a greater impact on structural reforms. Finally, the effects of adopting reforms under IMF conditionality depend on domestic partisan politics.

KEYWORDS
developing countries, entropy balancing, IMF conditionality, initial conditions, structural reforms

JEL CLASSIFICATION
F33, F34, O24, O43, O47

1 | INTRODUCTION

Since their creation in 1944, the Bretton Woods Institutions (BWI)[1] have always tried to promote structural reforms in countries in general and in particular in developing countries through conditional lending programmes. Indeed, BWI member countries with macroeconomic imbalance problems and financing needs must comply with certain economic (or social and legal) conditions which in the International Monetary Fund (IMF) framework take the form of IMF programme conditionality. The aim of conditionality is to help countries resolve their financial and macroeconomic imbalances without resorting to measures that undermine national or international prosperity. In addition, conditionality is designed to preserve IMF resources by ensuring that a country's finances are strong enough to repay the loan, thus enabling other countries to use the resources if needed in the future.[2] To meet their obligations vis-à-vis the IMF and maintain their close ties with the institution to benefit from its role of lender of last resort, countries can engage in growth-promoting structural reforms to expand the tax base and generate sufficient fiscal resources to pay the IMF's loans. Starting from this initial intuition, this paper seeks to analyze whether the conditions attached to IMF loans are conducive to the implementation of structural reforms.

The IMF's conditionality programmes can influence structural reforms through various channels. The first direct channel is the 'carrot-and-stick'[3] effect of conditionality. Indeed, before a member country can receive credit tranches from the IMF, its government must meet certain conditions. According to the IMF, the conditions imposed are intended to contribute to liberalization, the reduction of public expenditure and inflation and the privatization of public enterprises (Boockmann & Dreher, 2003). Thus, successful implementation of the

[1]The World Bank (WB) and the International Monetary Fund (IMF).
[2]See https://www.imf.org/en/About/Factsheets/Sheets/2023/IMF-Conditionality.
[3]Injection of hard currency and compliance with conditions to access the loan tranches.

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conditions can contribute to reforming the sectors of activity in the country receiving conditional loans.

In addition to this formal channel, the literature highlights the fact that an international financial institution (IFI) such as the IMF can indirectly influence national policies even without imposing conditions. First, when a country has financial difficulties and turns to the IMF, this triggers a series of negotiations between national actors and the IMF. According to Stallings (1992), these negotiations can raise awareness of the 'threats' of macroeconomic imbalances and thus lead national actors to adopt a different policy approach. During these negotiations, countries requesting loans can benefit from policy advice, which could assist national actors to implement market-oriented policies or structural reforms (Haggard et al., 1994).

Although the above discussions seem to point to the idea that the IMF's conditionality can encourage structural reforms, some authors in the literature have pointed out that conditionality could discourage the implementation of reforms (Collier, 2000; Easterly, 2002; Khan, 1990). Indeed, conditionality is subject to a moral hazard problem. In order to remain eligible for IMF credit, member countries may deliberately refrain from reforming the economy (or reduce precautionary measures), thereby perpetuating inefficient structures or institutions (Easterly, 2002). Conditions can also be circumvented through the recipient country's implementation of compensatory measures not included in the programme. This lack of government involvement can thus distract from the expected results of IMF conditions and thus contribute to a regression of economic freedom. Drawing on these discussions, we can argue that the effect of IMF conditions on structural reforms can be positive or negative making the question more empirical than theoretical.

The empirical literature on the role of IFIs in promoting market-oriented reforms is limited and the results are mixed. Kingstone and Young (2009) analyse the impact of IMF programmes on structural reforms (and sub-components) in 15 Latin American countries. Over the 1975–2003 period, the authors find that participation in IMF programmes contributes significantly to structural reforms. Specifically, the authors find that the IMF programmes promote tax, trade and capital account liberalization reforms as well as domestic financial reforms. One limitation of Kingstone and Young's analysis is that it does not take into account the IMF membership thus posing a selection bias problem. To address this limitation, Biglaiser and DeRouen (2011) use the same sample analysis focussing on the period from 1980 to 2003. Specifically, they focus on Standby Agreements (SBAs), the most commonly adopted IMF programme.[4] Their results suggest that the IMF programmes have a positive and statistically significant effect only in trade reform models. Abiad and Mody (2005) find in a study of 35 developing countries over the period 1973–96 that during periods of IMF programmes, there is a movement towards reform. In a study of 77 rich and developing countries, Henisz et al. (2005) analyze the impact of the strength of coercive pressures from multilateral lenders on market-based reforms in the telecommunications and electricity sectors. Measuring the strength of coercive pressures as the ratio of the country's level of borrowing from the World Bank (WB) and the IMF to the country's gross domestic product (GDP), the authors find that over the period 1977–1999, international coercive pressures increased the likelihood of majority privatization and regulatory separation.

However, other empirical evidence finds that IFIs discourage structural reforms. Dreher and Rupprecht (2007), through an analysis of a panel of 116 countries over the period 1970–2000,

[4]These programmes generally cover a period of 12–18 months.

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find that IMF programmes have a negative effect on the index of economic freedom. Brooks and Kurtz (2007) analyze the effect of past WB and IMF financial flows on levels of trade liberalization and capital account openness in 19 Latin American countries over the period 1985–1999. The variables capturing past WB and IMF financial flows both have negative effects in the trade liberalization models, but only the variable capturing IMF financial flows is statistically significant. In the capital account liberalization models, none of the IFIs variables are statistically significant.

In this paper, we seek to analyze the effect of IMF programme conditionality on structural reforms. We make four contributions to the empirical literature. First, we examine the effect of conditionality on structural reforms using a new dataset. We consider five structural reforms: product market reforms, Labour market reforms (LMR), domestic and external finance reforms and trade reforms. The reform data are derived from Alesina et al.'s (2023) recent work. Indeed, alongside the study by Biglaiser and DeRouen (2011), our study is the first to focus on the impact of conditionality on the composition of structural reforms by distinguishing the effect of conditions by each sector of reforms. Our study differs from previous studies by focussing on policy and conditionality heterogeneity through a new dataset from Kentikelenis et al. (2016). This dataset has the advantage of providing more disaggregated information on conditions across time and countries. There is a categorization of conditions imposed on countries that want to borrow from IMF coffers. These categories of conditions include Quantitative performance criteria (QPC), indicative benchmarks, prior actions (PAs), structural performance criteria (SPC) and structural benchmarks (SBs).[5] This categorization of conditions determines not only the relative weight that the IMF attaches to the implementation of the respective conditions imposed but also the degree of freedom that borrowing countries have (Kentikelenis et al., 2016).[6] Second, we take into account structural factors that could condition the impact of IMF programme conditionality on structural reforms, in particular the business cycle, the quality of fiscal and monetary policy, the level of development and the quality of institutions. Thirdly, our study distinguishes between the impact of programmes without conditions and the impact of successful conditionality programmes (conditions met). Finally, this research acknowledges that the consequences of IMF conditionality in terms of reform vary depending on the political orientation of the participating governments and the level of domestic support or resistance they encounter during the implementation of reform measures. Indeed, according to Beazer and Woo (2016)'s research on post-communist countries, more conditions lead to more pronounced progress in implementing reforms under left-leaning governments. However, under right-leaning governments, additional conditions do not necessarily ensure greater progress in reforms.

The main result—which passes a set of robustness tests—of this study is that IMF conditions (conditionality) contribute to the promotion of structural reforms in developing countries. However, there is no statistical evidence that unconditional loans are effective in promoting structural reforms. Depending on the categorization of conditions and the dimensionality of reforms, our results reveal that 'quantitative conditions' promote trade, financial and product market reforms. In contrast, 'structural conditions' promote only labour market-oriented reforms. A much more disaggregated analysis shows that among the 'quantitative conditions',

[5] See S3 on data description for a definition of each condition.

[6] When conditions are not implemented, this is likely to result in programme interruptions or delays in the disbursement of credit or non-credit tranches by the IMF.

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only the 'quantitative performance criteria' improve the implementation of the five reforms studied. However, among the 'structural conditions', the promotion of reforms is significantly ensured by the 'structural benchmarks' conditions. The heterogeneity tests performed subsequently show that the impact of conditions could vary according to the business cycle, fiscal or monetary stance or income level of the country. Interestingly, the impact of conditions depends on institutional quality. Indeed, our estimates show that in countries with higher institutional quality, IMF conditions are effective in terms of implementing structural reforms, while in countries with low institutional quality, they are not. As for the dynamics of the effect of conditions on reforms, the results show that the effect of conditions is durable but loses intensity over time. This decrease in intensity over time could be described as 'reform fatigue' linked to electoral cycles (Bowen et al., 2016). Focussing on met versus unmet conditions, our estimates reveal that the effect of conditions depends on the success of the conditions, and the magnitude of the effect is larger for met conditions. Using a quantile regression approach, we show that the effect of IMF conditionality may depend on the initial level of reforms in the country receiving the IMF loan. Finally, our findings suggest that the effectiveness of conditional programmes in terms of progress in structural reforms depends on the political orientation of the incumbent government. Indeed, we observe that, when it comes to left-leaning governments, IMF conditional programmes have led to significant advancements in structural reforms, whereas reform progress has been slowed down by high-conditionality programmes under right-leaning governments.

The rest of the paper is structured as follows: Section 2 provides a brief overview of the importance of structural reforms and the role of IMF conditionality. Section 3 describes the main data used. Section 4 presents the estimation methodology. Section 5 presents the main results and Section 6 the robustness analyses. Section 7 presents the effect of the composition of structural reforms as well as conditionality, whereas Section 8 takes into account the political orientation of the government. Section 9 provides the conclusion.

2 | BACKGROUND

2.1 | Why do market-oriented policy reforms matter?

Modern economies are characterized by competitive heterogeneity (product and service differentiation) that creates rent situations for certain economic agents. Indeed, these economic agents, by providing goods or services, obtain a higher remuneration than they would in an economy of pure and perfect competition. The existence of these rent situations can be explained by many factors: the existence of long-term relationships between economic agents for insurance reasons, the rigidity of prices (companies do not constantly revise prices for cost reasons) and wages. Moreover, the regulatory and institutional framework can be factors contributing to rent-seeking (or rent-raising). In the case of imperfect competition, the economic theory proposes the implementation of structural reforms to make the economy more competitive and more resistant to shocks, thus stimulating potential supply while reducing price and wage rigidity. Therefore, the implementation of reforms aims at redistributing market rents among economic agents (Antipa et al., 2008).

In this perspective, it is generally agreed that market liberalization reforms could be a catalyst for economic development. However, it should be noted that in the short term, these reforms could create winners and losers, but in the long term, there is a broad consensus that

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they could create more winners (Alesina & Drazen, 1991; Antipa et al., 2008; Martinelli & Escorza, 2007). Consequently, many international organizations like the IMF and the WB strongly emphasize the need to free the economy from excessive government intervention through their adjustment programmes (De Haan et al., 2006). Indeed, for these international financial institutions, market institutions have the capacity to efficiently transmit information (or market signals) and enforce property rights and contracts, while ensuring competition which incentivizes new enterprises to enter the market (Islam, 2002).

Empirically, numerous studies have analyzed the impact of market-oriented reforms on various economic outcomes, notably economic growth (Gomado, 2024; Marrazzo & Terzi, 2017; Ostry et al., 2021), productivity improvement (Konte et al., 2022), openness to international trade (Sachs & Warner, 1995), public expenditures and debt (Afonso et al., 2021; Furceri & Jalles, 2020), inflation levels (Barro, 1996) and income inequality (Agnello et al., 2012; Christopoulos & McAdam, 2017; Gomado, 2023; Wiese et al., 2024). Generally speaking, although empirical evidence is not unanimous regarding the short-term economic effects of reforms, a broad consensus emerges on their positive long-term effects. Empirical studies have therefore focused on factors that can explain public policy choices regarding reforms in both developed and developing economies. These factors include economic growth (Aghion & Blanchard, 1994; Campos & Horváth, 2012), the deterioration of economic conditions—"the crisis-induced reform hypothesis" (Drazen & Grilli, 1990; J. M. Nelson, 1990; Haggard et al., 1994; E. Lora & Olivera, 2004), institutional quality and political fragmentation (Alesina & Drazen, 1991; Drazen, 2002b; Fernández-Arias & Montiel, 2001). Additionally, external factors, such as foreign aid in the form of financial assistance programmes, for example, those of the IMF or sovereign debt restructuring, are also conditioned on the implementation of a series of structural reforms in beneficiary countries (Agnello et al., 2015; Drazen, 2002b; Fernández-Arias & Montiel, 2001). In the following section, we focus on the role of international factors, particularly IMF conditionality, in promoting market-oriented reforms.

2.2 | IMF conditionality and market-oriented policy reforms

Domestic reforms can be influenced by international factors in various ways, including peer pressure and imitation, binding agreements or treaties and competitive pressures (Høj et al., 2006; Mukherjee & Singer, 2010; S. C. Nelson, 2016). Indeed, empirical literature identifies that foreign aid, participation in various international aid programmes such as those managed by the IMF or the WB or membership in other international organizations can be a source of progress (or regression) in structural reforms in developing countries (Bearce & Tirone, 2010; Dreher, 2003, 2009; Dreher et al., 2009; Dreher & Rupprecht, 2007; Dutta & Williamson, 2016; Murphy, 2016; Stocker, 2016; Tarabar & Young, 2017). This section particularly focuses on the impact of binding agreements or treaties through IMF conditionality programmes with an objective approach.[7]

In its role as a lender of last resort, the IMF's Articles of Agreement stipulate that borrowing countries must have policies consistent with the Fund's objectives (IMF, 2016). To ensure the

[7]For a detailed literature review on the role of international factors on reform choices, see Banerjee and Rondinelli (2003); Kilby (2005); Dreher and Gehring (2012); Smets (2016); Giordano and Pagano (2017); Moll and Smets (2020); Lawson et al. (2020); etc.

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countries meet these objectives, the IMF develops 'conditionality', which conditions the granting of credit on the implementation of specific programmes or policies (Busse & Vogel, 2024). Thus, since the IMF's inception, the use of conditionality in programmes recommended to borrowing countries has steadily increased over the years, and the number of imposed conditions has continued to grow (Kentikelenis et al., 2016). Theoretically, the literature identifies five main objectives of IMF loan conditionality (Dreher, 2009).

First, conditionality aims to encourage borrowing countries to pursue reforms they would not have chosen without the credit, including reforms to combat corruption. Indeed, according to the IMF, conditionality is an important way to preserve its resources. Thus, to ensure repayment, the IMF, as a lender, attaches conditions to its loans (Dreher, 2009; Khan, 2001). Second, IMF conditionality serves as a commitment instrument to avoid time inconsistency problems as conditions are intended to provide credibility. In other words, the role of conditionality is to make future policy changes in borrowing countries more difficult. In countries with high levels of external debt, governments are disinterested in reform efforts, believing that the gains from reforms would largely benefit creditors while the costs are borne by indebted countries. Thus, to prevent and avoid a decrease in debt repayments, IMF conditionality would allow countries to continue their reform efforts (Diwan & Rodrik, 1992; Fafchamps, 1996; Sachs, 1989). Third, conditionality is used to reveal the type or nature of the borrowing government. Indeed, for more productive outcomes, it can be argued that the IMF is more likely to provide funds to countries whose governments are competent in implementing good economic policies. Borrowing countries are generally characterized by asymmetric information environments, so conditionality can serve as an instrument to address the adverse selection problem. According to Nichols and Zeckhauser (1982), imposing conditions ensures that only governments that truly need IMF financing will use them. Fourth, IMF loans can be seen as income insurance against negative shocks (Vaubel, 1983). In this context, IMF conditionality aims to address the moral hazard problem in two ways: debtor moral hazard and creditor moral hazard. Debtor moral hazard refers to the potential behaviour of governments seeking IMF financial support to avoid or delay necessary reforms for economic viability. Creditor moral hazard, on the other hand, concerns the behaviour of creditors who continue to lend to a country despite the lack of convincing reforms, expecting that the country will continue to have access to IMF resources (Dreher, 2006, 2009). Thus, IMF conditionality could slow the adoption of structural reforms. However, it is expected that the strict application of conditionality would deter borrowing country governments from abusing loans, instead encouraging them to implement the necessary economic and political reforms (Dreher & Vaubel, 2004; Vaubel, 1991). Finally, the IMF would play a paternalistic role. Given that the fund's preferences regarding the use of loans differ from those of borrowing governments, the IMF may want to restrict the use of loans to increase recipient welfare. Loans can be used to pursue policies of redistribution from the rich to the poor, which would be difficult to achieve without conditionality on the loans (Little et al., 1965).

A significant portion of the literature on conditionality highlights the importance of the concept of 'ownership' (Calvo-Gonzalez, 2007; Dang & Stone, 2021; Drazen, 2002a; Konstantinidis & Reinsberg, 2023; Reinsberg et al., 2021, 2022). From this perspective, governments receiving IMF assistance are more likely to implement recommendations they consider their own rather than those perceived as externally imposed (Bird & Willett, 2004; Konstantinidis & Reinsberg, 2020). This approach suggests that the sense of ownership diminishes as the number of imposed conditions increases. In response to this observation, the IMF, as part of its efforts to 'streamline' the conditions of its programmes, has sought to broaden participation in the

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discussions leading up to the establishment of agreements (Erbas, 2004; IMF, 2021). This strategy aims to involve a wider range of social actors in the negotiation and formulation process of the programmes. The dual objective is to strengthen local commitment to the proposed reforms and improve the long-term effectiveness of the fund's interventions by ensuring they receive broader support within the civil society of the recipient country.

In light of the above, many proponents of IMF policies highlight the importance of the IMF in developing reforms, including structural, fiscal and institutional reforms. These reforms play a crucial role in market economies. Indeed, financial sector reforms, for example, contribute to the development of the financial sector by developing financial institutions (insurance companies, pension funds, banks, mutual funds and other types of non-bank financial institutions) and developing financial markets (stock and bond markets) enabling an increase in credit services to the private sector. Financial development thus facilitates the development of more skill-intensive and high value-added industries (Feenstra et al., 2013; Levchenko, 2007; Sheng & Yang, 2016). Furthermore, IMF conditions calling for institutional reforms promote better bureaucratic quality, improved rule of law and increased transparency. Thus, according to empirical literature, better institutional quality is a source of economic performance through the development of higher value-added sectors, skill development, new production technologies and new product development (Acemoglu et al., 2007; Feenstra et al., 2013; Levchenko, 2007; Sheng & Yang, 2016). Conditionality also targets the implementation of reforms to limit state intervention (privatization of state-owned enterprises), reduce budget deficits and streamline government bureaucracy. These reforms can help avoid the crowding out effect and thus allow for competition, greater efficiency and increased growth. Conditionality also calls for reforms increasing central bank independence in their objective of price stabilization and reducing uncertainty regarding monetary policy (Demir, 2022).

To reduce ineffective policies in borrowing countries, the IMF imposes two types of conditionality instruments: quantitative conditionality and structural conditionality (Boughton, 2012; Kentikelenis et al., 2016, 2017; Stubbs et al., 2020). Quantitative conditions often include reforms or regulations related to budget balances, international reserves or external borrowing limits. These are the most common conditionality instruments imposed by the IMF, and they regulate the borrowing country's fiscal policy. Although quantitative conditions guide a country towards achieving a certain macroeconomic objective, they do not specify how the country should achieve this objective set by the IMF programme. This is why the IMF also imposes structural conditions, which formulate specific policy requirements to achieve the macroeconomic and governance objectives required by the loan agreement (Babb & Carruthers, 2008; El-Shagi & Yamarik, 2021). Structural conditions impose specific reforms aimed at changing economic and political rules and regulations as well as the fundamental structures of government institutions. These conditions include reforms such as the privatization of state-owned enterprises, establishing regulations ensuring the independence of financial institutions, labour market liberalization and overhauling tax policies or exchange rate systems to align these economies with modern market standards (Kentikelenis et al., 2016; Stubbs et al., 2020).

To sum up, in light of the various mechanisms examined, it appears that the IMF can influence the pace of reforms in a country in different ways (Boockmann & Dreher, 2003; Dreher, 2006). On one hand, through its conditionality programmes, the IMF can raise government awareness of the importance of reforms and encourage them to reach a consensus on the policies to be adopted by offering policy advice, technical assistance and funds to compensate politically influential groups that might be negatively affected by these reforms in

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the short term (Rodrik, 1996). On the other hand, IMF conditionality could act as an obstacle to reforms and even contribute to the reversal of reforms in countries with IMF programmes. Indeed, as highlighted by the work of Rodrik (1996) and Hsieh (2000), when a country enters into credit agreements with the IMF under conditionality, these credits ease the budget constraint of the beneficiary country, and thus the threshold for initiating reforms is either reached with some delay or not at all, thereby contributing to the survival of inefficient structures. From this perspective, it seems that countries are more incentivized to implement reforms ex ante to receive the first tranche of the conditional loan but then annul them ex post to create structural imbalances that they can promise to reform when they request new credits from the IMF (Dreher, 2006; Heckelman & Knack, 2008).[8] According to the research by Smith and Vreeland (2004), the IMF frequently provides support through credits to governments that do not implement reforms.

3 | DATA DESCRIPTION AND STYLIZED FACTS

3.1 | Structural reforms datasets

The structural reform indicators used in this study are derived from those constructed by Alesina et al. (2023). These indicators focus on specific aspects of structural reforms aimed at liberalizing certain markets. The reforms cover two main economic sectors, namely the real sector and the financial sector. Real sector reforms cover trade (tariff), product and LMR. Financial reforms cover domestic and external finance.[9]

Trade reforms: Trade reforms measure tariffs at the product level. It aggregates tariff data at the product level by calculating simple, weighted averages (the weights are the share of exports of each product). These averages are then normalized from 0 (closed to trade) to 1 (fully open to trade).

Product market reforms: For product market reforms, the indicator considers liberalization in the telecommunications (competition, state ownership, presence or absence of an independent regulator and degree of government intervention in access to telecommunications) and electricity sectors (consolidation or unbundling of generation, transmission and distribution, state ownership, presence or absence of an independent regulator and degree of liberalization). For each of these dimensions, the product market reforms indicator ranges from 0 to 1, with 0 representing a country with a higher degree of repression and 1 representing a fully liberalized country. The aggregated index is constructed as the sum of the two sub-indicators and is normalized to range between 0 and 1, with higher values indicating a greater degree of liberalization in this sector.

LMR: LMR, on the other hand, provide indicators on employment protection legislation and the termination of full-time permanent contracts. Employment protection legislation

[8] A frequently cited anecdotal example in the literature concerns Kenya. According to Collier (1997), 'over a 15-year period, the Government of Kenya sold the same agricultural reform to the World Bank four times, each time reversing it after receiving the aid'. Another notable case is Pakistan, where the World Bank and the IMF provided 22 conditional loan programmes to encourage the Pakistani government to reduce budget deficits, which were never achieved (Heckelman & Knack, 2008; Mallaby, 2006).

[9] For a detailed description of the reform indicators, please refer to Table C1 in Appendix C.

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covers procedural requirements (third-party approval), redundancy costs (severance pay and rating requirements) and the grounds for dismissal with or without recourse. The aggregated index is constructed as the sum of the sub-indicators and is normalized to range between 0 and 1, with higher values indicating a greater degree of liberalization.

Financial reforms: Financial sector reforms are those covering domestic finance and external finance. Domestic finance reforms cover six dimensions of financial regulation: credit control, interest rate controls, barriers to entry into banks, banking supervision, privatization and security market development. As for external finance, the reforms cover restrictions on capital outflows and restrictions on capital inflows. Thus, the aggregate index on domestic finance reforms is a composite of the following six sub-indicators: credit controls, interest rate controls, bank entry barriers, banking supervision, privatization and security market development. The aggregate index of external finance is a composite of an index on capital outflow restrictions and an index on capital inflow restrictions. Each index is normalized to a range between 0 and 1, where higher values indicate a higher level of liberalization.

The evolution of reforms over 5-year averages in Figure 1 shows that trade reforms were faster in the 1970s and late 1980s than reforms in other sectors. This could be explained by the structural adjustment programmes that were more oriented towards trade openness. Over the years, the distribution of reform indices has narrowed and by the end of the period 2010–2014, 50% of countries have a liberalization index of at least 0.8, confirming that most countries have liberalized their trade regime. In addition to trade reforms, we observe that financial reforms have also made great progress. In particular, domestic financial reforms have shown strong variations over time. These developments can also be explained by the importance of IMF programmes. Indeed, most of the countries in the sample are dependent on IMF programmes with conditions, which have to meet a number of requirements such as the implementation of financial and fiscal reforms. Product market reforms, on the other hand, were less advanced in

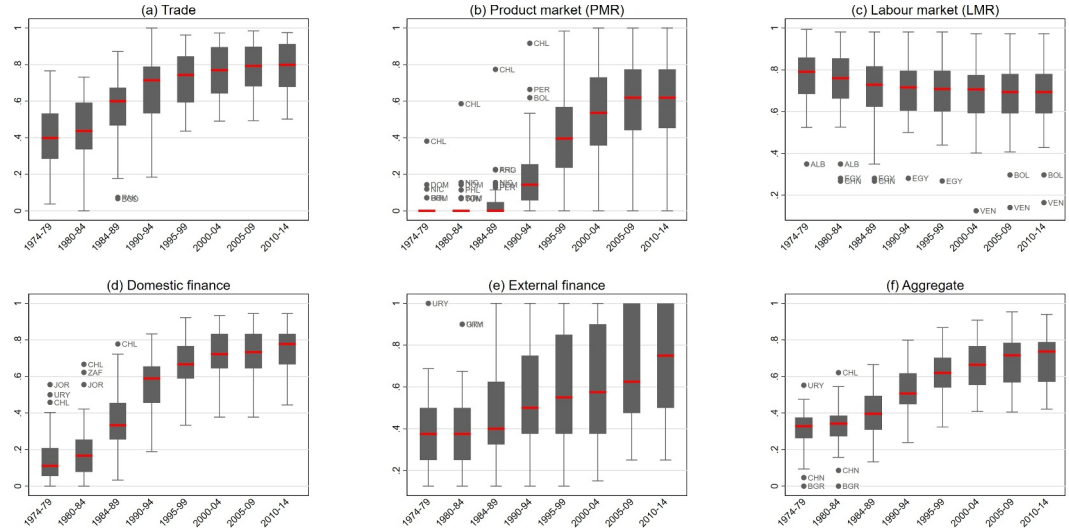

FIGURE 1 Evolution of the reform indices (5-year average). *Source*: Authors' illustration based on the data from Alesina et al. (2023). [Colour figure can be viewed at wileyonlinelibrary.com]

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the 1970s. The removal of barriers in the electricity and telecommunications markets only really started in the early 1990s. Nevertheless, it can be noted that some countries such as Chile and the Dominican Republic had started product market liberalization very early. Finally, LMR did not evolve significantly over the period studied.

3.2 | IMF conditionality datasets

Most IMF financing is provided in tranches and linked to demonstrable policy actions in candidate countries. The objective is to ensure progress in the implementation of supported programmes and thus limit the risks to IMF resources. The IMF uses surveillance tools to assess whether a programme it supports in a given country is on track and whether improvements are needed. For example, the IMF Executive Board conducts periodic reviews to assess whether programme conditions have been met and to provide insight into the need to adjust the programme in the light of new developments.

IMF programme conditions can take various forms, including QPC, Indicative targets (ITs), SBs, SPC and PAs (see Figure 2):

PAs are actions or measures that a country agrees to take before the IMF approves financing or completes a review. These actions are intended to ensure that the programme being financed will have the necessary foundation for success (e.g., elimination of price controls and a budget consistent with the fiscal framework).

QPCs refer to specific, measurable conditions that must be achieved. These conditions relate to macroeconomic variables such as monetary and credit aggregates, international reserves, fiscal balances and external borrowing, which are under the control of the national authorities.

ITs are complementary to QPCs. They are intended to assess progress towards a programme's goals. They are sometimes set instead of QPCs because of uncertainty about the reliability of the data. As uncertainty decreases, these targets may become QPCs, with appropriate modifications.

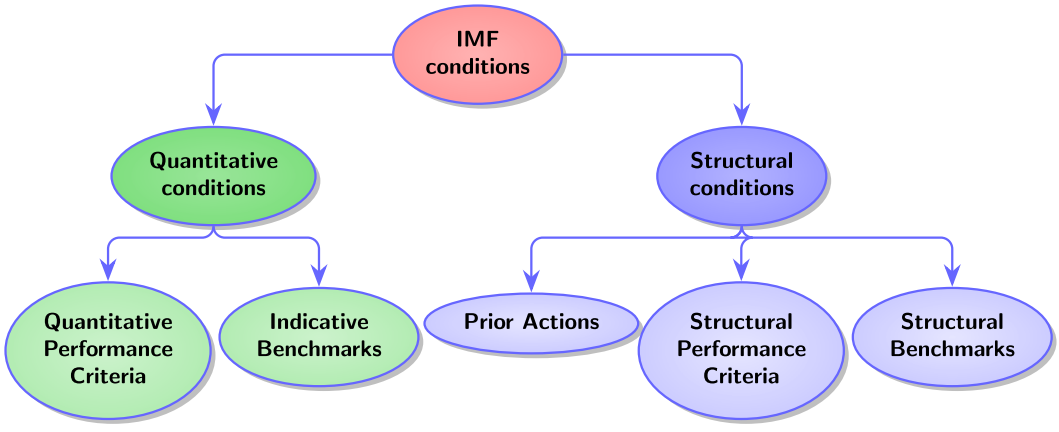

FIGURE 2 Categories of conditions. *Source*: Authors' illustration based on Kentikelenis et al. (2016). [Colour figure can be viewed at wileyonlinelibrary.com]

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SBs are often not quantifiable but are used as critical markers to assess the implementation of the programme. Thus, examples of SBs include improving financial sector operations, building up social safety nets and strengthening public financial management.

SPCs are structural measures that are important to implement and that must be met for an IMF arrangement to continue.

The dataset is derived from the IMF's Monitoring of Fund Arrangements database and consists of annual data for a panel of 135 emerging and low-income countries spanning the years 1985–2014 (Kentikelenis et al., 2016). However, for the purpose of this study, we focus on a reduced sample of 64 countries due to data availability limitations.

In Figure 3, we provide an overview of the average evolution in conditions associated with IMF-supported programmes during the period 1980–2014. Detailed descriptive statistics are available in Table A1 in the Appendix. Notably, there has been a significant evolution in conditionality. Initially, the average number of conditions imposed by the IMF on beneficiary countries was relatively low. However, by 1999, this average had risen to approximately 13 conditions. The graph in Figure 3 illustrates these changes, including a reduction in the number of conditions starting around 2000. Additionally, the graph highlights the impact of the global financial crisis in 2008, which further accelerated the reduction of conditions before a subsequent upward trend.

In the annex, Figure A1 presents the evolution of various categories of conditions and aggregated reforms. In response to criticism from researchers and policymakers in host countries, the IMF Board introduced the 'streamlining initiative', which gradually led to the removal of SPC, resulting in an average of about six structural conditions per year. Notably, we observe

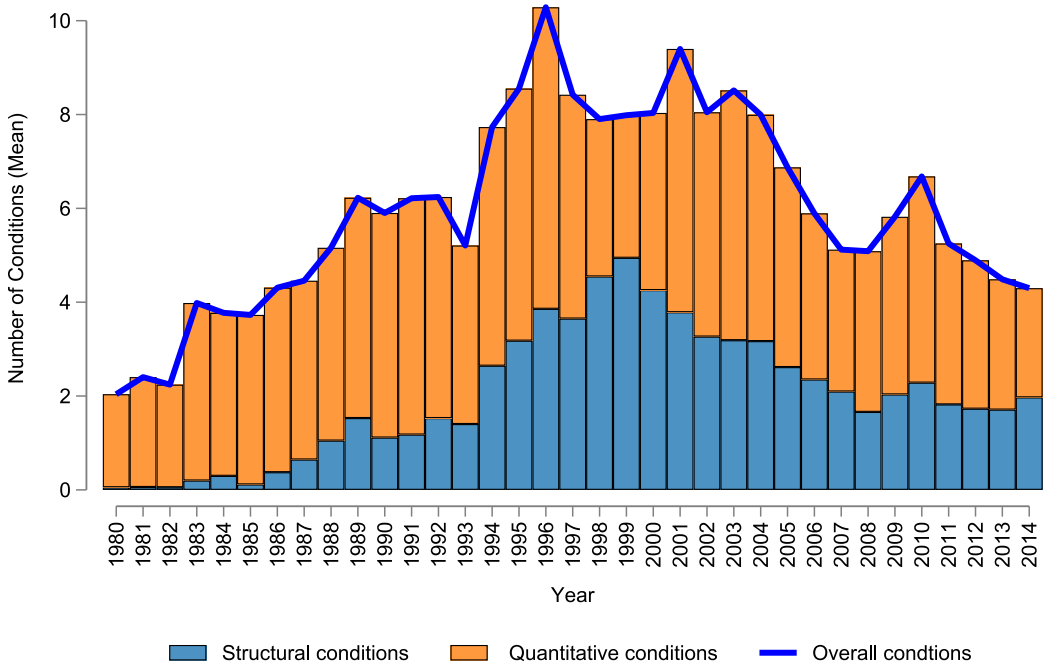

FIGURE 3 Average number of conditions by year. *Source*: Author's illustrations based on data from Kentikelenis et al. (2016). [Colour figure can be viewed at wileyonlinelibrary.com]

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similar dynamics in the aggregate reform indicator and the various types of conditionality over the period from 1980 to 2000. These observed similarities serve as a basis for our regression analysis, which aims to investigate the relationship between IMF conditions and structural reforms. In the following section, we delve into an analysis of whether IMF conditions influence structural reforms.

3.3 | Dependent, interest and control variables

The dependent variable of this paper is the structural reforms computed as the average of the five reforms previously presented. For the variable of interest, we follow Wei and Zhang (2010); Crivelli and Gupta (2016); Busse and Vogel (2024) by defining a dummy variable that takes 1 if a country *i* at date *t* has at least one of the previously presented IMF conditions and 0 otherwise.

For the control group, we carefully select units without IMF programme conditionality that are, on average, as similar as possible to the treatment group consisting of units with 'IMF programme conditionality', in terms of relevant pre-treatment characteristics. Following Jorra (2012) and Balima and Sy (2021), we include the following control variables: GDP growth, debt service to exports, reserves to imports, external debt to GDP and parliamentary democracy. We augment this specification by adding real GDP per capita and domestic credit to private sector to capture the level of development and domestic financial sector development, respectively. Based on Balima and Sy (2021), we expect that countries with IMF programme conditionality will be marked by lower real GDP growth, higher debt service to GDP, lower reserves to imports, higher external debt to GDP and lower level of parliamentary democracy. Finally, we hypothesize that both levels of development, namely real GDP per capita and financial development represented by the domestic credit to private sector, will show a negative correlation with the IMF programme. This suggests that less developed countries, which often struggle to access international financial markets or have limited financial development, may be

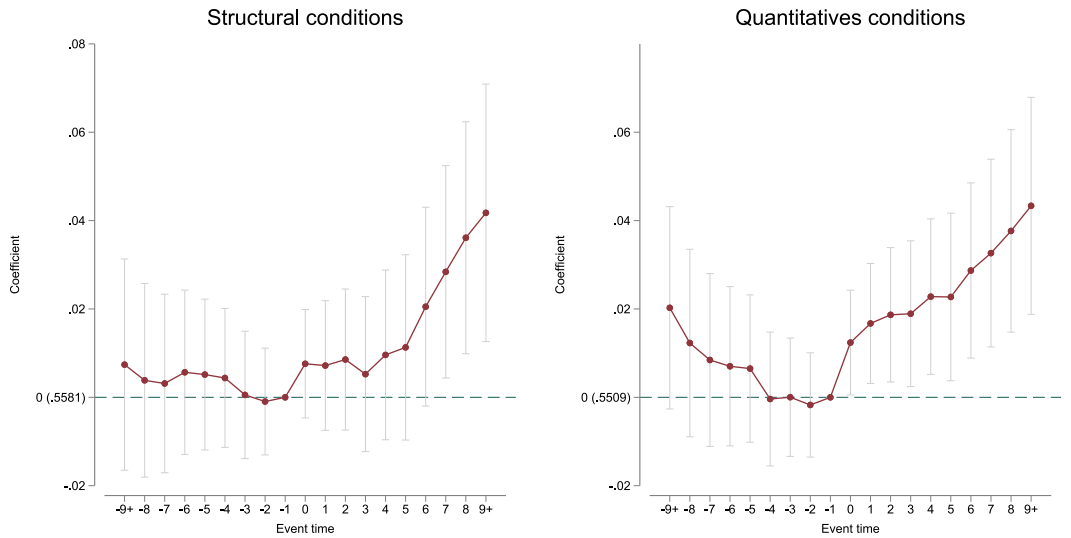

FIGURE 4 Event-study plot for the impact of conditionality (structural and quantitative) over time on (aggregate) structural reforms. *Source*: Author's illustration based on study data. [Colour figure can be viewed at wileyonlinelibrary.com]

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more likely to rely on the IMF to address their savings gap. For robustness concerns, we add to these variables a large number of other potential determinants of IMF conditionality (structural reforms). Finally, to contain the reverse causality, we lag these variables by one period. The list of countries and data sources are provided in the appendix, specifically in Tables C2 and C3.

To analyze the general trend of reforms we conduct an event study. This preliminary event study, conducted before any causal analysis, provides an idea of the potential effects of periods of conditionality on the progression of structural reforms. For this purpose, we consider a window of 9 years before and after the introduction of the conditions (structural and quantitative). Figure 4 shows that there is no evidence of pre-trend before the year the IMF conditions were adopted. After the adoption of the conditions, we observe a significant progression in structural reforms from the first year until the last year.

4 | ESTIMATION APPROACH

4.1 | Methodology

This study analyses the effect of IMF (programme) conditionality on structural reforms. The main challenge is to establish a causal link from IMF conditionality to structural reforms. Indeed, two major problems arise in identifying the effect of IMF programme conditionality, namely counterfactual and endogeneity issues (Balima & Sy, 2021; Bird, 2001; Dreher & Walter, 2010). On the one hand, it is difficult to correctly predict the outcome that would have been obtained in the absence of a programme and to quantify the impact induced by programme participation. On the other hand, countries resort to the IMF in critical economic situations characterized by low economic growth or recessions, and poor external financial conditions, making programme participation non-random due to selection bias. In other words, when countries borrow from the IMF, their governments agree to adjust their economic policies to address problems that motivated them to seek financial assistance. These policy adjustments—which are tied to IMF conditions making their implementation non-random—are conditions of IMF loans and serve to ensure that a given country can repay the IMF.[10] To circumvent these problems and identify the effect of IMF conditionality, we use an impact assessment method, namely entropy balancing developed by Hainmueller (2012). This approach is used in the economic literature, including Neuenkirch and Neumeier (2016) to assess the impact of U.S. sanctions on poverty, Balima and Sy (2021) to evaluate the fiscal effect of IMF programmes. The entropy balance method has recently been applied by Apeti (2023a), Apeti and Edoh (2023), Apeti (2023b) and Apeti and N'Doua (2023) to analyse the welfare and fiscal impact of financial innovation such as mobile money, the effect of sovereign debt default on inequality and the trade effect of timber and timber products regulations. Similar methods are used by Oberdabernig (2013) and Bird et al. (2021) to assess social effects of IMF programmes.

The approach used in this study is based on the principle that IMF conditionality are the treatment and structural reforms is the outcome variable. The units of observations are country-year observations. The observations with IMF conditionality are the treatment group, and those without IMF conditionality are the control group. The treatment effect on the treated (ATT) is defined as follows:

[10]See https://www.imf.org/en/About/Factsheets/Sheets/2016/08/02/21/28/IMF-Conditionality.

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$$ATT = E[Y_{(1)}|T=1] - E[Y_{(0)}|T=1] \quad (1)$$

where $Y_{(.)}$ is the outcome variable measuring structural reforms. T indicates whether the observation unit is subject to IMF conditionality ($T=1$) or not ($T=0$). $E[Y_{(1)}|T=1]$ is structural reforms during the IMF conditionality period, $E[Y_{(0)}|T=1]$ represents the counterfactual outcome for countries that adopted IMF conditionality, that is, the result of structural reforms in those countries if they had not implemented IMF conditionality.

The issue is that $E[Y_{(0)}|T=1]$ is not observable due to the non-random nature of IMF conditionality. If this were the case, the ATT could easily be identified by comparing structural reforms in IMF conditionality countries with non-IMF conditionality countries. Identifying ATT then requires a good proxy for $E[Y_{(0)}|T=1]$. To do so, we match IMF conditionality units with non-IMF conditionality units that are as close as possible on observable characteristics that meet two criteria: correlated with IMF conditionality and structural reforms. Under the condition that the non-IMF conditionality units are fairly close to the IMF conditionality units, any difference in structural reforms is attributable to IMF conditionality adoption. Based on these different elements, we can rewrite Equation (1) as follows:

$$ATT = E[Y_{(1)}|T=1, X=x] - E[Y_{(0)}|T=0, X=x] \quad (2)$$

where $X=x$ is a vector of observable covariates that may affect both the decision to adopt IMF conditionality and structural reforms, $E[Y_{(1)}|T=1, X=x]$ is structural reforms of IMF conditionality units and $E[Y_{(0)}|T=0, X=x]$ is the expected structural reforms for the synthetic control units. Estimating the ATT by entropy balancing involves two steps. The first is to compute weights for the control group (non-treated group). These weights may satisfy pre-specified balanced constraints involving sample moments of observable characteristics (X). Following Neuenkirch and Neumeier (2016), we choose balance constraints that impose equal covariates means between the treatment and control groups. In doing so, we want to ensure that the control group, on average, has non-treatment units that are as similar as possible to the treated units.[11] The second uses the weights from the first step in a regression analysis where structural reforms are the dependent variable. In the second step, we control for the covariates employed in the first step. This is equivalent to including control variables in a randomized experiment and increases estimation efficiency. Furthermore, in the second step, time- and country-specific effects are incorporated to account for time-specific factors like the global financial crisis as well as country-specific variations resulting from differences in political, economic and institutional environments.

The associated second step regression equation is as follows:

$$Y_{it} = \alpha_i + \tau T_{it} + \beta X_{it} + \mu_t + \varepsilon_{it} \quad (3)$$

where index i refers to the country and t to the year. τ represents the ATT as defined above. α_i is a country-fixed effect, μ_t represents time-fixed effect and X_{it} is the set of pre-treatment

[11]This procedure ensures that once the weights are generated, IMF conditionality and non-IMF conditionality countries exhibit similar trends in their outcome variable over the pre-treatment period (see Ogrokhina & Rodriguez, 2019).

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characteristics employed in the matching procedure. Including the X_{it} vector in the regression analysis is equivalent to including control variables in a randomized experiment and improves estimation efficiency. Equation (3) is estimated using weighted least squares. Weights for observations in the treatment group are 1 while observations in the control group have a positive weight obtained from the first step of the matching approach.

Entropy balancing allows us to identify the effect of IMF conditionality by comparing IMF conditionality and non-IMF conditionality countries (or units) that are similar on observable characteristics while taking care to account for country- and time-specific effects. By combining both a matching and regression approach, this method offers some advantages over several existing methods as listed by Neuenkirch and Neumeier (2016). A particularly important advantage is that entropy balancing is non-parametric in the sense that no empirical model for either the outcome variable or selection into treatment needs to be specified. Hence, potential types of misspecification like those, for instance, regarding the functional form of the empirical model, which likely lead to biased estimates, are ruled out. Also, in contrast to regression-based analyses, treatment effects estimates based on entropy balancing do not suffer from multicollinearity, as the reweighting scheme orthogonalizes the covariates with respect to the treatment indicator.

Moreover, in contrast to other matching methods, entropy balancing ensures a high covariate balance between the treatment and control group even in small samples. With 'conventional' matching methods such as, for instance, nearest neighbour matching or propensity score matching (PSM), each treated unit—in the simplest case—is matched with the one untreated unit that is closest in terms of a metric balancing score. Accordingly, the control group is comprised of only a subset of the units that are not subject to treatment (Diamond & Sekhon, 2013; Hainmueller, 2012). In other words, with conventional matching methods, each untreated unit either receives a weight equal to 0, in the event it does not represent a best match for a treated unit or equal to 1, in the event it does represent a best match for one treated unit. However, when the number of untreated units is limited and the number of pre-treatment characteristics is large, this procedure does not guarantee a sufficient balance of pre-treatment characteristics across the treatment and control groups. This is a serious problem, as a low covariate balance may lead to biased treatment effect estimates. In contrast, with entropy balancing, the vector of weights assigned to the units not exposed to treatment is allowed to contain any non-negative values. Thus, a synthetic control group is designed that represents a virtually perfect image of the treatment group. Entropy balancing thus can be interpreted as a generalization of conventional matching approaches.[12] Moreover, compared to conventional matching where the control units are either discarded or matched, entropy balancing uses more flexible reweighting schemes. It reweights units with the goal of achieving balance between treated and untreated while keeping the weights as close as possible to the base weights to avoid a loss of information.

Finally, by combining a reweighting scheme with a regression analysis, entropy balancing allows us to properly address the panel structure of our data. In particular, we are able to control for both country-fixed as well as time-fixed effects in the second step of the matching approach, that is, the regression analysis. The inclusion of country-fixed effects is particularly

[12]Hainmueller (2012), using Monte Carlo simulations as well as empirical applications, shows that entropy balancing outperforms other matching techniques, such as propensity score matching, nearest neighbour matching and genetic matching, in terms of estimation bias and mean square error.

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useful in accounting for the potential unobserved heterogeneity between countries that have never adopted IMF conditionality and those that have adopted it, given that economic and political environments of these two groups of countries may differ beyond the set of covariates used in the entropy balancing approach. By including country-fixed effects, we also control time-invariant country-specific factors that could lead to differences in structural reforms across countries. In other words, including country-fixed effects allows us to control for country-specific characteristics that may influence IMF conditionality adoption or shape structural reforms in the sample countries. As stated earlier, time-fixed effects allow us to control time-specific effects such as the global financial crisis that may affect the countries in our sample. Despite the various advantages discussed in this section, it is essential to note that this approach may have some limits. Indeed, entropy balancing may fail to control potential endogeneity biases resulting from unobserved time-varying factors that may affect both IMF conditionality and structural reforms on the one hand, and on the other hand, to successfully deal with the inertia of structural reforms. To test the robustness of our conclusions, we complete the entropy balancing by alternative estimation methods such as ordinary least squares (OLS), PSM and a two-step system generalized method of moments (GMM) dynamic panel estimator. Finally, in addition to the endogeneity of conditionality, participation in IMF programmes is not the result of a random process. The circumstances of countries with IMF programmes are systematically different from those of countries without IMF programmes. This difference in circumstances may in turn affect the outcome of interest-structural reforms. While some empirical studies have shown that selection into IMF programmes depends on many factors, such as the level of international reserves, economic growth or even the political regime (Barro & Lee, 2005; Moser & Sturm, 2011), others have also shown that IMF lending is a function of the Fund's major shareholders (Steinwand & Stone, 2008). As a result, we test the robustness of our results using a fourth alternative method, the conditional mixed-process estimator (CMP) method used in the literature to assess the impact of conditionality on macroeconomic outcomes (Demir, 2022; Forster et al., 2020; Stubbs et al., 2020).

5 | RESULTS

5.1 | Covariates balance

We begin this section by analysing the performance of entropy balancing. To do so, we present some descriptive statistics obtained before and after weighting used to estimate the treatment effect of IMF conditionality. Table 1 presents in columns [1] and [2] the sample mean before weighting for country-year observations for the treatment group (with IMF conditionality) and the control group (without IMF conditionality), respectively. Column [3] of this table reports the difference in means between the two groups. The results reveal a difference between these two groups. Indeed, the IMF conditionality countries are characterized by lower real GDP growth, higher debt service to GDP, lower reserves to imports, higher external debt to GDP, lower level of parliamentary democracy, lower level of development, that is, real GDP per capita and lower financial development, that is, lower domestic credit to private sector. These findings are consistent with the expected relationship between the IMF conditionality and the various control variables discussed above. These differences across IMF conditionality and non-IMF conditionality countries show the importance of selecting an appropriate control group when

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TABLE 1 Descriptive statistics before weighting.

	[1] IMF conditionality	[2] No IMF conditionality	[3] = [1]−[2] Diff
GDP growth (lag)	3.294	4.725	−1.431***
Debt service to exports (lag)	25.38	19.58	5.8***
Reserves to imports (lag)	29.98	43.01	−13.03***
External debt to GDP (lag)	65.36	45.35	20.01***
Parliamentary democracy (lag)	0.1407	0.1933	−0.0526***
Real GDP per capita (lag)	3714	5127	−1413***
Domestic credit to private sector (lag)	22.77	41.78	−19.01***
Observations	590	776	

***$p \leq 0.01$; **$p \leq 0.05$; *$p \leq 0.1$.

computing the treatment effect of IMF conditionality to avoid incorrectly estimated treatment effects.

In Table 2, columns [1] and [2] display the sample mean after weighting both the treatment group and the synthetic group acquired through entropy balancing. Column [3] illustrates the difference between these two means. The analysis of the two groups in this table reveals the effectiveness of entropy balancing as the difference shown in the previous table seems to disappear. As a result, entropy balancing allows us to construct a perfect synthetic control group closely similar to the IMF conditionality countries in terms of the mean values of the pre-treatment covariates.

5.2 | Treatment effects

With the synthetic controls in Table 2, we estimate the effect of IMF conditionality on structural reforms (ATT) in developing countries using the weighted least squares method. The results are reported in Table 3. Columns [1]–[4] present the second-stage results with no addition of the covariates used in the first stage in computing the synthetic group. Column [1] excludes country and year fixed effects. Columns [2]–[3] include, respectively, country and year fixed effects whereas column [4] includes these two effects jointly. Finally, columns [5]–[8] repeat the exercise of columns [1]–[4] except for adding in each second-stage regression the covariates used in the first stage, namely GDP growth, debt service to exports, reserves to imports, external debt to GDP, parliamentary democracy, real GDP per capita and domestic credit to private sector. It is useful to note that including matching covariates in the second stage of entropy balancing increases the quality of the matching (as in a randomized experiment) whereas controlling for country and year fixed effects eliminates any country and year fixed effects.

Independent of the specification, IMF conditionality significantly increases (at 1%) structural reforms in our sample countries. This result ranges from 1.9% points (column [2]) to 6% points (column [5]) with an average effect of 3.7% points. In other words, IMF conditionality increases on average structural reforms by 3.7% points in countries using IMF conditionality compared to non-IMF conditionality countries.

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TABLE 2 Descriptive statistics after weighting.

	[1] IMF conditionality	[2] Synthetic control	[3] = [1]−[2] Diff
GDP growth (lag)	3.294	3.317	−0.023
Debt service to exports (lag)	25.38	25.19	0.19
Reserves to imports (lag)	29.98	30.46	−0.48
External debt to GDP (lag)	65.36	64.81	0.55
Parliamentary democracy (lag)	0.1407	0.1442	−0.0035
Real GDP per capita (lag)	3714	3762	−48
Domestic credit to private sector (lag)	22.77	23.93	−1.16
Observations	590	776	
Total of weights	590	590	

***$p \leq 0.01$; **$p \leq 0.05$; *$p \leq 0.1$.

TABLE 3 IMF programme conditionality and structural reforms.

Structural reforms	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
IMF conditionality	0.057***	0.022***	0.042***	0.019***	0.060***	0.025***	0.051***	0.020***
	(0.0114)	(0.0075)	(0.0106)	(0.0044)	(0.0092)	(0.0070)	(0.0074)	(0.0043)
Covariates in the second step	No	No	No	No	Yes	Yes	Yes	Yes
Year fixed effect in the second step	No	No	Yes	Yes	No	No	Yes	Yes
Country fixed effect in the second step	No	Yes	No	Yes	No	Yes	No	Yes
Observations	1366	1366	1366	1366	1366	1366	1366	1366
R^2	0.023	0.595	0.358	0.888	0.328	0.660	0.667	0.899

Note: Unreported constant included. Standard errors in brackets.

***$p \leq 0.01$; **$p \leq 0.05$; *$p \leq 0.1$.

6 | ROBUSTNESS CHECKS

Our estimations show that IMF conditionality significantly increases structural reforms in developing countries. In this section, we test the robustness of these findings.

6.1 | Alternative specifications

We begin this section by excluding some countries or periods. First, we exclude countries or periods that may exhibit high (low) reliance on the IMF or high (low) incentives to reform, such as fragile states, former and current communist countries, hyperinflation episodes and deep recession (saving glut). The results of these different tests presented in columns [1]–[6] of Table B1 in Appendix provide robust results to our baseline findings. Next, we include

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developed countries in our sample. Results in column [7] of Table B1 in Appendix show that extending our country list to developed countries does not alter our conclusion: IMF conditions promote structural reforms. Finally, we exclude non-IMF condition countries from our sample because treated countries (IMF programme condition countries) may differ from non-treated countries (non-IMF condition countries) beyond the characteristics we control for in our model (Neuenkirch & Neumeier, 2015). Moreover, since we drop the non-IMF condition countries, which are essentially our control groups, there is a risk that the effect captured is simply a secular trend and not necessarily due to IMF conditions since by excluding these countries, our analysis is equivalent to comparing structural reforms before and after the treatment of treated countries, that is, IMF condition countries. To overcome this problem, we add a time trend to our model. The results of Table B1 (column [8]) in Appendix provide relatively similar results to our baseline findings.

Second, we test the consistency of our results by including a set of additional control variables. Based on the literature on IMF programme conditions and structural reforms, the following variables are selected: election, years left in current term, government polarization, checks and balances, real exchange rate, exchange rate regime, financial crisis, democracy, trade openness, current account balance, inflation, financial openness, sovereign credit default swaps market dummy, growth volatility, Gini index (market) and Gini index (net). In addition to these control variables, we include time trends to capture potential linear changes that may exist in our outcome variable, that is, structural reforms (Apeti & Edoh, 2023; Saka et al., 2022). Indeed, since the 1980s—with the notable exception of the global financial crisis with a modest reversal of reforms in some countries—there are broad trends to pursue liberalization/structural reforms (Alesina et al., 2023). In addition, the graphs on data relating to reforms/liberalisation (Figure 1) suggest a strong upward trend in the liberalisation sub-indices, which may drive the results in an environment where the number of economies with IMF conditionality is increasing or expanding. Consequently, we assume that these trends may cause linear evolution or secular trends that time-fixed effects cannot fully capture. Columns [9]–[26] of Table B1 in appendix, which report the results of these specifications, show their consistency with our baseline findings. In other words, adding these additional covariates does not change our results.

Third, the effect observed in this study could be susceptible to certain issues. For instance, IMF conditionality might trigger changes in the economic environment of countries. As a result, the effect observed may not be solely attributable to IMF conditionality but could be influenced by alterations in institutional, political, social or economic conditions following its implementation. To circumvent this problem, we use a similar approach to Neuenkirch and Neumeier (2015) by computing four new treatment variables defined over a 5-year window around the adoption of IMF conditions, that is, from 5 years before to 5 years after, from 4 years before to 4 years after, from 3 years before to 3 years after and from 2 years before to 2 years after. Results from these different specifications, presented in Table 4 (columns [1]–[4]), are consistent with our baseline findings. As a result, we can conclude that the effect of IMF conditionality on structural reforms is not due to changes in countries' political, economic, or institutional environments after the introduction of the programme. In other words, the effect identified in this paper is due to the introduction of IMF conditionality and not potential changes in the economic, political, social, or institutional environment that this conditionality may induce in our sample countries.

Fourth, we perform a placebo (falsification) test. To do this, we define placebo or arbitrary dates for IMF conditionality, computed by randomly assigning conditionality episodes to countries in our sample after removing actual condition years. The intuition is that if our

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TABLE 4 Adjusting the treatment variable and placebo test.

	[1] Structural reforms	[2] Structural reforms	[3] Structural reforms	[4] Structural reforms	[5] Structural reforms	[6] Structural reforms
IMF conditionality [2; 2]	0.010*					
	(0.0053)					
IMF conditionality [3; 3]		0.011**				
		(0.0048)				
IMF conditionality [4; 4]			0.011**			
			(0.0048)			
IMF conditionality [5; 5]				0.013***		
				(0.0045)		
Placebo IMF conditionality					−0.001	
					(0.0044)	
Reforms gap (vis-à-vis USA)						−0.020***
						(0.0043)
Covariates in the second step	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes
Observations	530	663	663	855	1062	1366
R^2	0.934	0.931	0.931	0.925	0.877	0.860

Note: Unreported constant included. Standard errors in brackets.

***$p \leq 0.01$; **$p \leq 0.05$; *$p \leq 0.1$.

baseline results are due to IMF conditionality, the use of placebo dates should produce statistically non-significant estimated effects. Results based on entropy balancing and using placebo IMF conditions are presented in column [5] of Table 4. The non-statistically significant effect of placebo IMF conditionality on structural reforms underscores the robustness of our findings, especially with respect to measurement error.

Fifth, we test the robustness of our results to changes in the definitions of our dependent and treatment variables. First, we change the definition of our dependent variable, that is, structural reforms, by computing the reform gap between the United States and every country in our sample. The results in Table 4 (column [6]) show that IMF conditions reduce the reform gap between the United States and countries with such conditions. In other words, altering the definition of our dependent variable does not change our conclusion: IMF conditionality favours structural reforms in developing countries. Finally, using a dummy variable in a cross-country study may ignore the treatment intensity. Indeed, the IMF conditionality variable has been transformed into a dummy variable to evaluate the effect in terms of impact analysis. In so doing, we overlook a great wealth of information, particularly that coming from the number of conditions. As a result, we test the

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robustness of our conclusion with a continuous treatment variable that is defined as the number of IMF conditions that country *i* has at time *t*. The estimation performed by the Blundell and Bond (1998) two-step system GMM dynamic panel estimator to contain potential endogeneity problems shows a positive effect of IMF conditionality on structural reforms (column [2] of Table 6). Specifically, an increase in the number of conditions increases structural reforms. This result shows that changing the measure of the treatment variable (from binary to continuous) does not alter the direction of our initial findings.

6.2 | Alternative estimation methods

We begin this exercise using the OLS method. Starting with a naive model that includes only the treatment variable as an explanatory variable, we gradually add the same control variables used in the entropy balancing approach, while carefully controlling for country and year fixed effects (see Neuenkirch & Neumeier, 2016). The result in columns [1] (the naive specification) to [8] (the baseline specification) of Supporting Information S1: Table B2 shows that, as in the entropy balancing approach, IMF conditionality favours structural reforms. Second, we augment our baseline specification with additional control variables used in the entropy balancing exercise. The results reported in columns [9]–[25] of Supporting Information S1: Table B2 remain consistent with those highlighted earlier: IMF conditionality favours structural reforms.

Next, we test the robustness of our results using PSM (Rosenbaum & Rubin, 1983), which is part of an impact analysis method. It allows us to correct endogeneity problems, particularly selection bias. The results in Table 5 compile the estimation of the IMF conditionality effect (ATT) using four matching methods: nearest-neighbour matching, radius matching, kernel matching and local linear regression matching. They allow us to confirm the consistency of our results with the choice of the alternative method, as the average treatment effects on the treated (ATTs) are both independent of the matching method used positively and statistically significant.

Third, we test the robustness of our results using the Blundell and Bond (1998) two-step system GMM dynamic panel estimator.[13] This method provides us with two major opportunities. First, it allows us to include the lagged structural reforms in the control variables to control potential inertia that may characterize reforms. Second, this method addresses the lack of a valid external instrument for estimating the causal effect of IMF conditionality on structural reforms while controlling for the Nickell bias that arises when estimating a dynamic panel with fixed effects. The results from this method are in column [1] of Table 6 and show that the IMF condition adoption significantly increases structural reforms. In addition, results show some persistence of structural reforms. This is signalled by a positive and significant coefficient of 0.91 for lagged structural reforms. The column [3] of Table 6 presents the results of the CMP method and the estimated effects are robust to the baseline results.

[13]This method combines equations in levels and first differences in a system and estimates them with an extended system GMM estimator that allows the use of lagged differences and levels of explanatory variables as instruments. Compared to the difference GMM estimator, the system GMM estimator allows introducing more instruments by adding a second equation, which should improve estimation efficiency. To tackle the instrument proliferation problem raised by the method above, we follow the author Roodman (2009) by collapsing the instrument matrix and limiting the number of lags to three. Moreover, to avoid that the standard errors are downward-biased, we use the Windmeijer (2005) finite sample correction to reduce the possibility of spurious precision.

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TABLE 5 IMF conditionality and structural reforms: using PSM.

Dependent variable: Structural reforms	Nearest-neighbour matching			Radius matching			Kernel matching	Local linear regression matching
	$N = 1$	$N = 2$	$N = 3$	$r = 0.005$	$r = 0.01$	$r = 0.05$		
IMF conditionality on structural reforms								
ATT	0.071***	0.076***	0.078***	0.072***	0.071***	0.065***	0.065***	0.066***
	(0.0149)	(0.0135)	(0.0127)	(0.0117)	(0.0108)	(0.0100)	(0.0100)	(0.0101)
Number of treated observations	590	590	590	590	590	590	590	590
Number of controls observations	776	776	776	776	776	776	776	776
Observations	1366	1366	1366	1366	1366	1366	1366	1366
Pseudo R^2	0.003	0.003	0.006	0.006	0.006	0.004	0.004	0.003
Standardized biases (p-value)	0.711	0.639	0.193	0.256	0.221	0.487	0.488	0.711
Rosenbaum bounds sensitivity tests	1.7	2	2.1	2.1	2.1	2	2	2

Note: Bootstrapped standard errors based on 500 replications reported in brackets. Standard errors in parentheses.
***$p \leq 0.01$; **$p \leq 0.05$; *$p \leq 0.1$.

Finally, our main identification method is based on impact analysis, in particular entropy balancing. This method, which combines a matching approach with two-way fixed effects, may have some limitations. First, the matching approach relies on observed characteristics and thus cannot handle unobserved omitted variables. Second, due to the staggered adoption situation, identification problems may arise, for example, due to negative weights in the two-way fixed effects, which may limit the validity of our conclusions (De Chaisemartin & d'Haultfoeuille, 2020; Goodman-Bacon, 2021; Callaway & Sant'Anna, 2021; Imai & Kim, 2021; Borusyak et al., 2024). To test the robustness of our results to these potential limitations, we use the Callaway 2021 difference method constructed to account for the limitations of two-way fixed effects. The results presented in column [4] of Table 6 support our baseline conclusions. IMF conditions reinforce the introduction of structural reforms.

Based on these different results, we can conclude that our results are robust to the choice of estimation method since changing the method does not qualitatively modify our conclusions.

7 | HETEROGENEITY

7.1 | Disaggregated analysis of structural reforms and IMF conditionality

There is significant diversity in the intensity and conditions imposed by the IMF on countries seeking loans. Additionally, reforms span across various sectors of activity, making it crucial to comprehend the specific type of conditionality that influences each type of reform. Hence, this

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TABLE 6 IMF conditionality and structural reforms using system GMM and CMP.

	[1] Structural reforms: System GMM	[2] Structural reforms: System GMM	[3] Structural reforms: CMP	[4] Callaway and Sant'Anna (2021)
Structural reform (lag)	0.910***	0.939***		
	(0.0747)	(0.0747)		
IMF conditionality (dummy)	0.080**		0.023**	0.048**
	(0.0337)		(0.0109)	(0.0248)
IMF conditionality (continue)		0.002*		
		(0.0009)		
Real GDP growth	0.007*	0.007*	0.001*	
	(0.0038)	(0.0043)	(0.0007)	
Debt service to exports	0.000	0.001	0.000	
	(0.0010)	(0.0011)	(0.0003)	
Reserves to imports	0.001**	0.000	0.000	
	(0.0002)	(0.0003)	(0.0002)	
External debt to GDP	−0.000	−0.000	−0.000***	
	(0.0004)	(0.0004)	(0.0001)	
Parliamentary democracy	0.019	0.018	0.011	
	(0.0342)	(0.0276)	(0.0443)	
Real GDP per capita	0.000	0.000	0.000	
	(0.0000)	(0.0000)	(0.0000)	
Financial development	−0.000	−0.000	0.000	
	(0.0003)	(0.0003)	(0.0004)	
Observations	308	308	1049	1960
AR(1)	0.006	0.008		
AR(2)	0.451	0.139		
Hansen *p*-value	0.120	0.178		
Nb. of instruments/ Nb. of countries	34/51	34/51		

Note: Standard errors in parentheses.

***$p \leq 0.01$; **$p \leq 0.05$; *$p \leq 0.1$.

section aims to analyse the impact based on the category of conditionality and the nature of the reforms.

First, in Table 7, we provide an analysis of the influence of total conditions on five different types of reforms. The findings reveal that IMF conditionality plays a significant role in promoting trade, external finance, domestic finance and product market reforms. These types of reforms show a clear positive association with the conditions imposed by the IMF. However,

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TABLE 7 Type of reform.

	[1] Trade reforms	[2] External financial reforms	[3] Domestic financial reforms	[4] Product market reforms	[5] Labour market reforms
IMF conditionality	0.022***	0.031***	0.013**	0.018**	0.006
	(0.0081)	(0.0095)	(0.0062)	(0.0075)	(0.0038)
Covariates in the second step	Yes	Yes	Yes	Yes	Yes
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes
Observations	1234	1366	1366	1366	1334
R^2	0.832	0.767	0.903	0.856	0.845

Note: Standard errors in parentheses.

***$p \leq 0.01$; **$p \leq 0.05$; *$p \leq 0.1$.

when it comes to LMR, the estimates suggest that there is no substantial statistical evidence supporting the importance of total conditionality in stimulating such reforms. In other words, the conditions imposed by the IMF do not appear to have a strong impact on LMR based on the available data and analysis.

Second, in Table 8, we examine the relationship between different categories of conditionality and aggregate reforms through regression analysis. Columns [1] and [5] specifically focus on the impact of structural and quantitative conditions, respectively, on aggregate reforms. Notably, both types of conditionality show a significant contribution to market liberalization. Indeed, it is noteworthy that periods of quantitative conditionality result in a significant increase of 2.4% points in structural reforms, with significance at a 1% level. However, structural conditions only prove significant at a 10% level, and periods of structural conditionality yield only a 0.7% point increase in structural reforms. These findings are surprizing as structural conditions are typically associated with a greater number of measures aimed at market liberalization.

To delve deeper into this relationship, we further break down the impact of different categories within the 'quantitative' and 'structural' conditions on aggregate reforms. In columns [2] to [4], we estimate the effects of various structural condition categories. Among these categories, it becomes evident that only 'structural benchmarks' play a role in promoting structural reforms. On the other hand, within the quantitative condition categories (columns [6] and [7]), only 'quantitative performance criteria' show a significant contribution to the implementation of structural reforms.

To summarize the findings, the analysis of different categories of conditionality reveals that, among the structural conditions, only 'structural benchmarks' have an impact on aggregate reforms. Conversely, among the quantitative conditions, only 'quantitative performance criteria' play a significant role in driving aggregate reforms. This highlights the varying effects and importance of specific conditionality categories in shaping overall reform outcomes. This conclusion represents an advancement compared to previous study findings and allows for a better distinction of specific conditions in IMF programmes that contribute to the adoption of

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TABLE 8 Type of conditionality.

	[1] Structural reforms	[2] Structural reforms	[3] Structural reforms	[4] Structural reforms	[5] Structural reforms	[6] Structural reforms	[7] Structural reforms
Structural conditions	0.007* (0.0044)						
Prior actions		0.001 (0.0044)					
Structural performance criteria			−0.000 (0.0045)				
Structural benchmarks				0.012*** (0.0044)			
Quantitative conditions					0.021*** (0.0043)		
Indicative benchmarks						0.004 (0.0041)	
Quantitative performance criteria							0.024*** (0.0042)
Covariates in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1366	1366	1366	1366	1366	1366	1366
R^2	0.905	0.900	0.917	0.917	0.908	0.917	0.899

Note: Standard errors in parentheses.

***$p \leq 0.01$; **$p \leq 0.05$; *$p \leq 0.1$.

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structural reforms in developing countries. In contrast to earlier studies, such as the one conducted by Beazer and Woo (2016), which suggested that structural conditions were associated with increased reforms in post-communist countries, our more detailed analysis indicates that it is, in fact, conditions related to SBs that have a greater influence on reforms.

Next, in Table 9, we explore the effects of conditionality categorized as structural conditions and 'quantitative conditions' on reforms in various sectors. The results indicate that quantitative conditions have a positive and statistically significant impact on reform indicators across most sectors, except for LMR (column [5]). To illustrate, let's consider the example of trade reforms (column [1]). The findings suggest that when a country accepts the 'quantitative conditions' set by the IMF, there is an average increase of 2.3% points in trade liberalization. However, the impact of structural conditions is significant mainly in the context of LMR (column [5]). This means that accepting the IMF's 'structural conditions' is associated with notable improvements in labour market-focused reforms. It is surprizing to note that 'structural conditions' do not appear to have an influence on the adoption of reforms in sectors other than the labour market. Indeed, about 70% of 'structural conditions' focus on the IMF's core areas of expertise, while the remaining 30% pertain to less crucial areas or fall under shared competencies with other international development institutions. Furthermore, it should be noted that only around 10% of structural conditions aim to promote economic growth and efficiency (Kim & Lee, 2021). In the context of the political economy of structural reforms, this result could be explained by the fact that structural conditions effectively illustrate the severity of the conditions imposed and are politically controversial, as they tend to intervene in a detailed manner in domestic economic policies (Reinsberg et al., 2022; Woo, 2013). Thus, due to the lack of adherence to these

TABLE 9 Quantitative conditions and structural conditions.

	[1] Trade reforms	[2] External financial reforms	[3] Domestic financial reforms	[4] Product market reforms	[5] Labour market reforms
Quantitative conditions	0.023*** (0.0080)	0.031*** (0.0095)	0.014** (0.0062)	0.016** (0.0076)	0.006 (0.0036)
Observations	1234	1366	1366	1366	1334
R^2	0.832	0.769	0.904	0.857	0.847
Structural conditions	−0.007 (0.0077)	0.007 (0.0096)	0.010 (0.0064)	0.013 (0.0081)	0.009** (0.0040)
Observations	1234	1366	1366	1366	1334
R^2	0.832	0.784	0.903	0.858	0.851
Covariates in the second step	Yes	Yes	Yes	Yes	Yes
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes

Note: Standard errors in parentheses.

***$p \leq 0.01$; **$p \leq 0.05$; *$p \leq 0.1$.

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conditions at the national level, they prove to be relatively less effective in promoting domestic reforms.

Finally, we undertake an alternative disaggregation of the impact of quantitative and structural conditions based on their different components, as outlined in Table 10. In the first three lines of the table, we focus on the influence of the components of structural conditions, namely 'structural benchmarks', 'structural performance criteria' and 'prior actions'.

Among these three categories of conditionality, we find that SBs have a favourable effect on the implementation of domestic financial and product market reforms, as well as LMR. This indicates that when countries adhere to the specific targets set by the IMF in the form of SBs, they are more likely to witness positive changes in these areas. On the other hand, the impact of SPC is significant only for LMR. This suggests that meeting the specific performance criteria related to labour market policies is instrumental in driving improvements in this particular

TABLE 10 Structural conditions by categories.

	[1] Trade	[2] External financial	[3] Domestic financial	[4] Product market	[5] Labour market
Structural conditions: *Structural benchmarks* [1]	−0.000 (0.0077)	0.010 (0.0097)	0.020*** (0.0064)	0.026*** (0.0091)	0.012*** (0.0047)
Observations	1234	1366	1366	1366	1334
R^2	0.841	0.804	0.907	0.868	0.852
Structural conditions: *Structural performance criteria* [2]	−0.009 (0.0088)	−0.012 (0.0102)	−0.002 (0.0071)	−0.012 (0.0094)	0.010** (0.0043)
Observations	1234	1366	1366	1366	1334
R^2	0.850	0.805	0.904	0.852	0.872
Structural conditions: *Prior actions* [3]	−0.007 (0.0076)	0.009 (0.0099)	−0.006 (0.0071)	0.012 (0.0092)	−0.003 (0.0042)
Observations	1234	1366	1366	1366	1334
R^2	0.844	0.810	0.895	0.858	0.870
Quantitative conditions: *Quantitative performance criteria* [4]	0.026*** (0.0079)	0.037*** (0.0095)	0.011* (0.0062)	0.021*** (0.0078)	0.010*** (0.0039)
Observations	1234	1366	1366	1366	1334
R^2	0.832	0.771	0.901	0.856	0.839
Quantitative conditions: *Indicative benchmarks* [5]	−0.008 (0.0078)	−0.003 (0.0092)	0.011 (0.0067)	0.020** (0.0091)	−0.000 (0.0039)
Observations	1234	1366	1366	1366	1334
R^2	0.851	0.801	0.906	0.865	0.864
Covariates in the second step	Yes	Yes	Yes	Yes	Yes
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes

Note: Standard errors in parentheses.

***$p \leq 0.01$; **$p \leq 0.05$; *$p \leq 0.1$.

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sector. The category of PAs, however, does not show a statistically significant impact on any of the studied reform dimensions.

Moving on to the components of quantitative conditions, namely 'quantitative performance criteria' and 'indicative benchmarks' (rows [4] to [5] of Table 10), the results reveal interesting patterns. Quantitative performance criteria have a positive and statistically significant effect on all five dimensions of reforms analysed. This indicates that countries that fulfil the quantitative targets set by the IMF in areas such as fiscal policies, monetary policies and other macroeconomic indicators are more likely to experience comprehensive reforms. On the other hand, conditions based on indicative benchmarks show a statistically significant positive effect solely on product market reforms. This suggests that meeting the indicative benchmarks specifically related to market competition and regulations can drive improvements in the product market sector.

7.2 | Further analyses

Addressing the durability of the impact of conditionality on reforms is a crucial concern. There is a possibility that a country might comply with IMF conditions solely to secure necessary loans, but once the funds are obtained, the country may disengage from pursuing the required reforms in various sectors. Therefore, we examine the dynamic effects of conditionality on aggregate reforms. In Table 11, we present the effects of total conditionality on aggregate reforms over a 5-year period. The findings reveal an immediate positive and statistically significant impact of conditionality on reforms. At the time of adoption, the magnitude of the coefficient is strong, indicating a substantial effect on reforms. However, as time passes, the amplitude of the coefficient diminishes. For instance, 1 year after the conditions are implemented, reforms increase by 1.9% points. However, 5 years after the adoption of the conditions, the improvement in sector liberalization is 1.4% points. This decline in intensity is commonly referred to as 'reform fatigue'. It is attributed to the fact that over time, people may lose confidence in the potential benefits of reforms, leading to a lack of public support. In other words, if there is no significant improvement in economic performance, policymakers implementing reforms may fear a lack of support from the electorate, which could potentially result in their removal from office. This fear of political repercussions can contribute to a diminishing drive to sustain or further pursue the necessary reforms (see, e.g., E. A. Lora et al., 2004; Bowen et al., 2016; Alesina et al., 2023).

Additionally, we consider various cyclical and structural characteristics in our analysis. The results presented in Table 12 indicate that the impact of conditionality on reforms is not dependent on the business cycle (good times vs. bad times), the level of development (emerging countries vs. low-income countries) or the monetary and fiscal stance (strong vs. loose). Interestingly, the findings show that the effect of conditionality is relatively more pronounced during periods of good economic conditions, in emerging countries and when monetary or fiscal policies are robust. This suggests that conditionality has a greater impact during favourable economic circumstances, in countries with greater development potential and when policy environments are conducive to reform implementation.

Furthermore, the results highlight the significance of institutional quality. Countries with better institutional frameworks benefit more from the reform-promoting effects of conditionality. It is worth noting that even countries with lower institutional quality can still experience a positive but statistically insignificant impact on reforms when subjected to conditionality

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TABLE 11 Effect over time.

	[1] Structural reforms	[2] Structural reforms	[3] Structural reforms	[4] Structural reforms	[5] Structural reforms	[6] Structural reforms
IMF conditionality ($t0$)	0.021*** (0.0068)					
IMF conditionality ($t+1$)		0.019*** (0.0057)				
IMF conditionality ($t+2$)			0.016*** (0.0051)			
IMF conditionality ($t+3$)				0.015*** (0.0047)		
IMF conditionality ($t+4$)					0.015*** (0.0045)	
IMF conditionality ($t+5$)						0.014*** (0.0044)
Covariates in the second step	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes
Observations	893	994	1066	1128	1176	1212
R^2	0.903	0.899	0.898	0.900	0.901	0.903

Note: Standard errors in parentheses.

***$p \leq 0.01$; **$p \leq 0.05$; *$p \leq 0.1$.

(column [5]). This implies that conditionality can incentivize countries with weaker institutions to improve them and subsequently benefit from the reforms. The analysis in column [6] reveals that programmes without conditions do not have a significant impact on reform. This underscores the importance of attaching conditions to IMF programmes to drive meaningful changes in policies and practices.

Moreover, column [7] examines the effects of conditions on the adoption of reforms in trading partner countries and neighbouring countries undergoing reforms. The results indicate that conditionality has a significant influence on reforms in trading partner countries. This suggests that when a country adopts IMF conditions and implements the associated reforms, it influences its trading partners to undertake similar reforms. Peer pressure or imitation among trading partners can contribute to this phenomenon. However, there is no strong statistical evidence of reform implementation in neighbouring countries. The effectiveness of met and unmet conditions on reforms is assessed in the final column. The findings show that both met and unmet conditions significantly contribute to structural reforms. However, in terms of intensity, the effectiveness of met conditions is 1.95 times greater compared to that of unmet conditions. This implies that when countries fully meet the conditions set by the IMF, the

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TABLE 12 Structural characteristics.

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Bad times	0.020*** (0.0061)							
Good times	0.025*** (0.0062)							
Loose fiscal stance		0.011* (0.0062)						
Strong fiscal stance		0.025*** (0.0053)						
Loose monetary stance			0.015** (0.0058)					
Strong monetary stance			0.026*** (0.0062)					
Developing countries				0.019*** (0.0052)				
Emerging countries				0.026*** (0.0064)				
Weak institutional quality					0.002 (0.0042)			
Sound institutional quality					0.036*** (0.0067)			
IMF programme w/o conditionality						−0.010 (0.0096)		
Reform in trading partners							0.020*** (0.0043)	
Reform in neighbouring countries							−0.004 (0.0040)	
Met								0.039*** (0.0135)
Not met								0.020*** (0.0045)
Covariates in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1366	1366	1366	1366	1236	1135	1366	1366
R^2	0.919	0.923	0.913	0.905	0. 943	0.911	0.865	0.938

Note: Standard errors in parentheses.

***$p \leq 0.01$; **$p \leq 0.05$; *$p \leq 0.1$.

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resulting reforms have a more substantial impact compared to cases where conditions are partially or not met.

Lastly, we employ quantile regression to examine the impact of conditionality on different segments of reform. This estimation method allows us to analyse low, intermediate and high levels of structural reform indices, enabling targeted policy implications based on a country's reform status. Figure 5 presents the results of the impact of conditionality (total) on aggregate reforms across various quantiles. The graph illustrates a significant positive effect, with the intensity of conditionality increasing from low reformers to intermediate high reformers (up to the 70th quantile). This indicates that conditionality has a notable impact on driving reforms for countries in these segments. However, beyond the 70th quantile, the intensity of conditionality weakens, although it remains positive for the top 30 reformers. This suggests that as the economy becomes more liberal and progresses with reforms, the imposition of further conditionality may become less effective and could potentially hinder the progress of more liberal economies.

8 | IMF CONDITIONALITY AND STRUCTURAL REFORMS: DO THE GOVERNMENTS' PARTISAN CONSTRAINTS MATTER?

Our baseline results have shown that periods of conditionality are associated with reform initiatives. However, after the signing of an IMF programme, it is the internal political processes that determine whether and how reforms are carried out. Hence, it's important to consider how the government's political orientation influences the adoption of reforms.

Indeed, existing literature highlights the fact that social groups as well as internal political opposition often hinder reform initiatives (Alesina & Drazen, 1991; Hellman, 1998; Przeworski, 1991). Thus, significant national actors play a decisive role in the favourable or unfavourable outcome of reforms by acting as 'stakeholders'. In other words, they are stakeholders who have both an interest in maintaining the current situation and the capacity to obstruct the adoption and successful implementation of reforms (Shleifer & Treisman, 2001). Such perspectives imply or explicitly highlight that potential reformers often make the most progress by

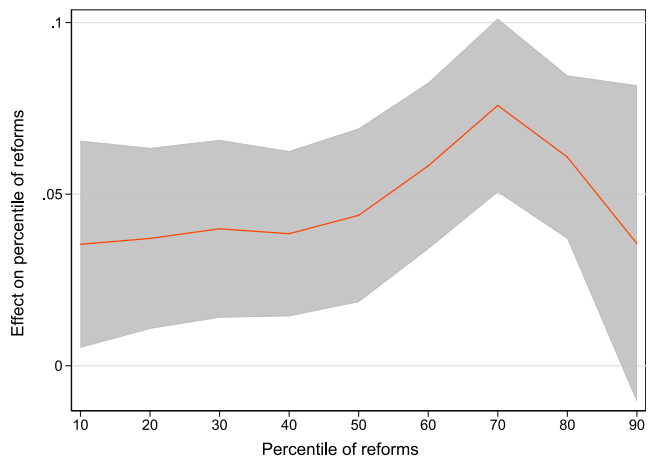

FIGURE 5 Impact of conditionality on reforms at different quantiles. *Source*: Author's illustration based on study data. [Colour figure can be viewed at wileyonlinelibrary.com]

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gaining the support of national stakeholders, even if this may involve concessions and compromises (Beazer & Woo, 2016).

It appears that the outcomes of IMF programmes are conditioned by how conditionality interacts with the internal political pressures of borrowing governments. Therefore, in accordance with the research conducted by Beazer and Woo (2016), in this section of the study, we shed light on an aspect of the internal political sphere that shapes the effect of conditionality on the adoption of structural reforms. This aspect pertains to the partisan orientation of participating governments and their inclination to confront opposition as the requirements or conditions of the IMF become stronger.

To empirically account for the borrowing government's political orientation, we utilize the government orientation indicator from the Database of Political Institutions, which provides data on institutional and electoral outcomes.[14] Specifically, this database categorizes governments as left-leaning, centrist or right-leaning. We apply the basic estimation method—entropy balancing— to assess the impact of conditionality periods on structural reforms using subsamples based on government orientation.

The results are presented in Table 13. Columns [1] and [2] depict the impact of conditionality periods on the adoption of reforms for right-leaning and centrist governments, respectively. It appears that conditionality periods indeed have a positive effect on the adoption of reforms by centrist or right-leaning governments, but this effect is not statistically significant at conventional thresholds. In contrast to right-leaning and centrist governments, the results shown in column [3] show that conditionality periods lead to a significant advancement in structural reforms when governments are left-leaning. More specifically, over the considered period and for left-leaning governments, episodes of conditionality result in a progress of reforms by 3.6% points. From column [4] to column [9], we break down the total conditions into quantitative and structural conditions. The results also show that quantitative or structural conditionality only leads to reform progress in left-wing governments. These findings align with those discovered by Beazer and Woo (2016), who examined the impact of IMF structural conditions on the advancement of economic reforms in post-communist countries. In succinct terms, the outcomes presented in Table 13 seem to support the notion that IMF conditionality periods yield greater progress in terms of structural reforms when concluded by left-leaning governments.

To better comprehend the results, it is crucial to recall the positions taken by left-leaning and right-leaning governments regarding market-oriented policies. In general, right-wing parties endorse market-friendly policies and the reforms recommended by the IMF, in contrast to left-wing parties. Thus, when left-leaning governments are tasked with implementing IMF-recommended measures and confront right-wing opposition, the latter have fewer reasons to oppose the suggested reforms, even as the requirements become more stringent. Consequently, the right-wing opponents' inclination towards economic liberalism facilitates the adoption of such policies and exerts heightened pressure on left-leaning governments to carry out the promised reforms. In other words, when left-leaning governments advocate for market-oriented reforms, their voters have limited political options, as shifting their support towards the right is likely not conducive to their anti-government stance. Conversely, when right-leaning governments undertake economic reforms, beneficiaries of public services may

[14] https://datacatalog.worldbank.org/search/dataset/0039819/Database-of-Political-Institutions.

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TABLE 13 IMF conditionality and structural reforms: The role of executive partisanship.

Dependent variable: Structural reforms	[1] Executive partisanship: Right	[2] Executive partisanship: Centre	[3] Executive partisanship: Left	[4] Executive partisanship: Right	[5] Executive partisanship: Centre	[6] Executive partisanship: Left	[7] Executive partisanship: Right	[8] Executive partisanship: Centre	[9] Executive partisanship: Left
IMF conditionality	0.011 (0.0087)	0.018 (0.0126)	0.036*** (0.0082)						
Quantitative conditions				0.011 (0.0089)	0.012 (0.0123)	0.035*** (0.0084)			
Structural conditions							0.003 (0.0088)	0.009 (0.0123)	0.033*** (0.0083)
Covariates in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	285	139	370	285	139	370	285	139	370
R^2	0.945	0.981	0.959	0.938	0.974	0.957	0.940	0.980	0.958

Note: Standard errors in parentheses.

***$p \leq 0.01$; **$p \leq 0.05$; *$p \leq 0.1$.

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encourage left-wing opposition leaders to politically obstruct these reforms (Beazer & Woo, 2016; Biglaiser & DeRouen, 2011).

In essence, it is not that left-leaning governments accepting IMF programmes are inherently more inclined towards reforms, but rather they face a distinct internal context compared to their right-leaning counterparts. For right-leaning governments, a stricter period of conditionality hampers progress by limiting the necessary manoeuvring space for leaders to carry out reforms in the face of left-wing opposition's distrust. On the other hand, left-leaning governments require less flexibility to implement similar reforms, as IMF conditions often align with the underlying political preferences of the opposition.

9 | CONCLUDING REMARKS

The aim of this paper is to analyse the effect of IMF conditionality on structural reforms in developing countries. Based on a sample of 64 developing countries over the period 1980–2014 and using entropy balancing, we show that periods of IMF conditionality are associated with higher structural reforms. In other words, we find that IMF programme conditionality promotes structural reforms. This result—robust to several tests including alternative specifications and alternative estimation methods—presents some heterogeneity. Indeed, we show that the effect of IMF conditionality can vary according to the type of conditionality, type of reform, time and initial level of structural reforms and can depend on some structural factors including the business cycle, the stance of fiscal and monetary policy, the level of development and the quality of institutions.

Moreover, we show that IMF conditionality might have spillover effects only on trading partners, and no evidence appears with geographic proximity. We also provide evidence that IMF programmes without conditionality do not promote structural reforms and successful IMF conditionality programmes tend to have a larger impact on structural reforms. Our analyses suggest that structural conditionality has not brought about changes in growth-focused structural policies in certain key sectors. These findings support recent criticisms of the IMF, advocating for limiting the fund's mandate to focus on its essential areas of expertise, such as providing short-term credits for external payments.

Finally, our findings suggest that the effectiveness of conditional programmes in terms of progress in structural reforms depends on the political orientation of the incumbent government. We observe that, when it comes to left-leaning governments, IMF conditional programmes have led to significant advancements in structural reforms, whereas reform progress has been slowed down by high-conditionality programmes under right-leaning governments.

Compared to developed countries, the COVID-19 crisis seems to leave persistent marks on developing countries' economies with a growth that is unlikely to reach the pre-pandemic stage sooner. As a result, international cooperation is likely needed to help these countries recover from the crisis and prepare them for crises that are likely to be frequent in a world characterized by global tensions and major environmental and social challenges. In particular, the IMF's contribution could play an important role in promoting reforms and, consequently, in promoting growth in these countries, which are currently experiencing weak growth dynamics owing to the COVID-19 crisis.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

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SUPPORTING INFORMATION

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APPENDIX A: DESCIPTIVE STATISTICS

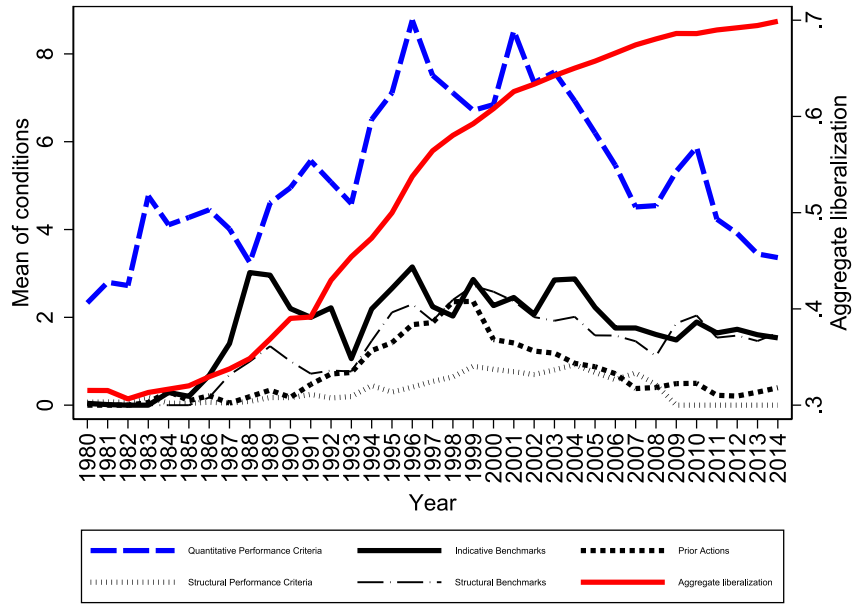

FIGURE A1 Average number of conditionality by categories. *Source*: Authors' illustration based on data from Kentikelenis et al. (2016). [Colour figure can be viewed at wileyonlinelibrary.com]

TABLE A1 Summary statistics.

	Full sample	EMs	LICs
Quantitative performance criteria	5.44 (10.61)	7.84 (12.35)	9.50 (11.99)
Structural benchmark	1.33 (3.855)	1.71 (4.624)	2.69 (4.440)
Structural performance criteria	0.33 (1.300)	0.40 (1.580)	0.76 (1.532)
Prior actions	0.77 (3.525)	1.16 (4.711)	1.16 (3.235)
Indicative targets	1.49 (4.746)	1.39 (4.139)	4.34 (7.986)
N	3261	1432	641

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APPENDIX B: ROBUSTNESS CHECKS

TABLE B1 IMF condition and structural reforms: sample alteration and additional controls.

	[1] Excluding fragile states	[2] Excluding former and current communist countries	[3] Excluding hyperinflation episodes	[4] Excluding GFC	[5] Excluding saving glut periods	[6] Excluding deep recession	[7] Including developed countries	[8] Time trend	[9] Time trend	[10] Election	[11] Years left in current term	[12] Government polarization	[13] Checks and balances
IMF conditionality	0.020*** (0.0045)	0.021*** (0.0045)	0.032*** (0.0055)	0.022*** (0.0048)	0.022*** (0.0048)	0.012*** (0.0042)	0.019*** (0.0039)	0.020*** (0.0043)	0.020*** (0.0043)	0.020*** (0.0043)	0.023*** (0.0044)	0.021*** (0.0042)	0.019*** (0.0042)
Covariates in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1302	1171	879	1078	1027	1202	2149	1334	1366	1366	1213	1362	1339
R^2	0.896	0.901	0.893	0.896	0.890	0.914	0.899	0.900	0.899	0.899	0.903	0.900	0.904
	[14] Real exchange rate	**[15] Exchange rate regime**	**[16] Financial crisis**	**[17] Democracy**	**[18] Trade openness**	**[19] Current account balance**	**[20] Inflation**	**[21] Financial openness**	**[22] Sovereign CDS dummy**	**[23] Growth volatility**	**[24] Gini index (market)**	**[25] Gini index (net)**	**[26] Education**
IMF conditionality	0.023*** (0.0043)	0.019*** (0.0042)	0.021*** (0.0042)	0.019*** (0.0043)	0.020*** (0.0042)	0.019*** (0.0042)	0.018*** (0.0045)	0.020*** (0.0039)	0.020*** (0.0043)	0.021*** (0.0043)	0.021*** (0.0041)	0.021*** (0.0041)	0.020*** (0.0044)
Covariates in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

(Continues)

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TABLE B1 (Continued)

	[14] Real exchange rate	[15] Exchange rate regime	[16] Financial crisis	[17] Democracy	[18] Trade openness	[19] Current account balance	[20] Inflation	[21] Financial openness	[22] Sovereign CDS dummy	[23] Growth volatility	[24] Gini index (market)	[25] Gini index (net)	[26] Education
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1366	1319	1366	1333	1364	1351	1216	1350	1366	1353	1227	1227	1041
R^2	0.902	0.903	0.901	0.899	0.900	0.900	0.914	0.921	0.899	0.900	0.914	0.914	0.906

Note: Unreported constant included. Standard errors in parentheses.

***$p \leq 0.01$; **$p \leq 0.05$; *$p \leq 0.1$.

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APPENDIX C: SAMPLE, DATA SOURCES AND VARIABLES CONSTRUCTION

TABLE C1 Structural reforms dimensions description.

Reforms	Dimension	Dimension description	Aggregate measure descriptions
Domestic finance	[1] Credit controls	It considers aspects of regulation related to the existence of reserve requirements, minimum amount of credit that is channelled to certain sectors and credit subsidies	
	[2] Interest rate controls	It captures government interventions in setting deposit and lending rates	
	[3] Bank entry barriers	It quantifies the degree of domestic competition to foreign and domestic banks, as well as the range of financial activity that a bank can engage with	Aggregate index on domestic finance regulations is a composite of the six sub-indicators
	[4] Banking supervision	It examines whether a country has adopted a capital adequacy ratio based on the basel standards, and whether there is an independent banking supervisory agency	
	[5] Privatization	It captures the market shares of state-owned banks in the domestic financial system	
	[6] Security market development	It considers whether a country has taken measures to develop securities markets	
External finance (capital account)	[1] Foreign direct investment	It quantifies the degree of government restrictions on exchange payments (receipts) of capital classified as FDI outflows (inflows)	
	[2] Portfolio investment	It quantifies the degree of government restrictions on exchange (receipts) payments of capital classified as portfolio equity outflows (inflows)	
	[3] Bond market	It quantifies the degree of government restrictions on exchange payments (receipts) of capital through transactions of bonds or other debt securities	Aggregate index of external finance is a composite of an index on capital outflow restrictions and an index on capital inflow restrictions
	[4] Money markets	It quantifies the degree of government restrictions on exchange payments (receipts) of capital through transactions of money market instruments	

(Continues)

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TABLE C1 (Continued)

Reforms	Dimension	Dimension description	Aggregate measure descriptions
	[5] Finance and lending markets	It quantifies the degree of government restrictions on exchange payments (receipts) of capital through financial credits	
Product market	[1] Access (telecommunication)	It captures the degree of government intervention in the access to electricity	
	[2] Competition (telecommunication)	'It captures the degree of the market competition by the number of existing companies that is, one (monopoly), two (duopoly), or three or more (competitive)'	
	[3] Regulation (telecommunication)	It examines whether there is an independent regulatory agency	
	[4] Ownership (telecommunication)	It quantifies the extent of state-owned firms in the market	
	[1] Wholesale (electricity)	It examines whether there is a liberalized wholesale market	Aggregated index is constructed as the sum of two sub-indicators (telecommunication and electricity) and is normalized from zero to one
	[2] Unbundling (electricity)	'It captures the degree of vertical integration in the market that is, whether generation, transmission and distribution are unbundled'	
	[3] Regulation (electricity)	It examines whether there is an independent regulatory agency	
	[4] Ownership (electricity)	It quantifies the extent of state-owned firms in the market	
Trade	[1] Tariff rates	It provides the simple average tariff rates across products	Aggregate index of trade openness is the simple average of an aggregated index on tariff rates and an aggregated index on current account transactions
	[2] Current account transactions	It quantifies the degree of government restrictions on the payments for external trade	

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TABLE C1 (Continued)

Reforms	Dimension	Dimension description	Aggregate measure descriptions
Labour market reforms (LMR)	[1] Valid grounds	It captures the freedom of the employer in deciding when to dismiss workers and which workers to dismiss	
	[2] Procedural inconvenience	It includes provisions such as consultation with workers' representatives and third-party approval	
	[3] Firing costs	It consists of minimum notice periods and severance payments	Aggregated index is constructed as the sum of the five sub-indicators and is normalized from zero to one
	[4] Redress measures	It concerns provisions such as the possibility for the worker of being reinstated in employment or to receive a compensation following an unfair dismissal	
	[5] Additional requirements for collective dismissals	It accounts for additional restrictions imposed to the employer when dismissing a large number of workers for economic reasons	

Note: Each sub-index is coded from zero (fully repressed) to three (fully liberalized).

TABLE C2 Countries list (64).

Albania (ALB)	Dominican Republic (DOM)	Kyrgyzstan (KGZ)	Roumania (ROU)
Algeria (DZA)	Ecuador (ECU)	Latvia (LVA)	Russia (RUS)
Argentina (ARG)	Egypt (EGY)	Lithuania (LTU)	Senegal (SEN)
Azerbaijan (AZE)	El Salvador (SLV)	Madagascar (MDG)	South Africa (ZAF)
Bangladesh (BGD)	Estonia (EST)	Malaysia (MYS)	Sri Lanka (LKA)
Belarus (BLR)	Ethiopia (ETH)	Mexico (MEX)	Tanzania (TZA)
Bolivia (BOL)	Georgia (GEO)	Morocco (MAR)	Thailand (THA)
Brazil (BRA)	Ghana (GHA)	Mozambique (MOZ)	Tunisia (TUN)
Bulgaria (BGR)	Guatemala (GTM)	Nepal (NPL)	Turkey (TUR)
Burkina Faso (BFA)	Hungary (HUN)	Nicaragua (NIC)	Uganda (UGA)
Cameroon (CMR)	India (IND)	Nigeria (NGA)	Ukraine (UKR)
Chile (CHL)	Indonesia (IDN)	Pakistan (PAK)	Uruguay (URY)
China (CHN)	Jamaica (JAM)	Paraguay (PRY)	Uzbekistan (UZB)
Colombia (COL)	Jordan (JOR)	Peru (PER)	Venezuela (VEN)
Costa Rica (CRI)	Kazakhstan (KAZ)	Philippines (PHL)	Vietnam (VNM)
Cote d'Ivoire (CIV)	Kenya (KEN)	Poland (POL)	Zimbabwe (ZWE)

Note: Country code in parentheses.

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TABLE C3 Data sources.

Variables	Sources
Structural reforms index	Alesina et al. (2023)
IMF conditionality	Kentikelenis et al. (2016)
Trade (% of GDP)	WDI
Foreign direct investment, net inflows (% of GDP)	WDI
Unemployment, total (% of total labour force)	WDI
Inflation (average consumer prices)	WDI
General government final consumption expenditure (% of GDP)	WDI
Unemployment, total (% of total labour force)	WDI
ICRG institutional quality	Teorell et al. (2018)
Gross fixed capital formation (% of GDP)	WDI
IMF programme dummy	Dreher (2006)
GDP growth (annual %)	WDI
Age dependency ratio, young (% of working-age population)	WDI
Reforms gap vis-à-vis of USA	Author's calculation based on Alesina et al. (2023)
Reform in neighbouring countries	Author's calculation based on Alesina et al. (2023)
Legislative or executive election	Database of political institutions 2020 (DPI2020)
Gini coefficient	UNU-WIDER (WIID)
Cyclical component of GDP (output gap)	Author's calculation based on WDI
Human capital index	PTW

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